

Study Guide

For use with pages 362–367

GOAL Calculate interest earned and account balances.**VOCABULARY**

The amount earned or paid for the use of money is called **interest**.
 The amount of money deposited or borrowed is the **principal**. Interest that is earned or paid only on the principal is called **simple interest**.
 The percent of the principal earned or paid per year is the **annual interest rate**.

The **balance** A of an account that earns simple annual interest is the sum of the principal P and the interest Prt .

Compound interest is interest that is earned on both the principal and any interest that has been earned previously.

EXAMPLE 1 Finding Simple Interest

You purchase a bond for \$450. The bond earns 6.5% simple annual interest. How much interest will the bond earn after 10 years?

Solution

$$I = Prt$$

Write simple interest formula.

$$= (450)(0.065)(10)$$

Substitute 450 for P , 0.065 for r , and 10 for t .

$$= 292.5$$

Multiply.

Answer: The bond will earn \$292.50 in interest after 10 years.

EXAMPLE 2 Finding an Interest Rate

You deposit \$600 into an account that earns simple annual interest. After 18 months, the balance is \$648.60. Find the annual interest rate.

Solution

$$A = P(1 + rt)$$

Write formula for finding balance.

$$648.60 = 600 \left[1 + r \left(\frac{3}{2} \right) \right]$$

Substitute. 18 months = $\frac{18}{12}$ years = $\frac{3}{2}$ years

$$648.60 = 600 + 900r$$

Distributive property

$$48.60 = 900r$$

Subtract 600 from each side.

$$0.054 = r$$

Divide each side by 900.

Answer: The annual interest rate is 5.4%.

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Exercises for Examples 1 and 2

1. A \$1600 bond earns 5.2% simple annual interest. What is the interest earned after 3 years?

Find the unknown quantity for an account that earns simple annual interest.

2. $A = \$5037.50$, $P = \$5000$, $r = 3\%$, $t = \underline{\quad ? \quad}$
 3. $A = \$1337.50$, $P = \underline{\quad ? \quad}$, $r = 4\%$, $t = 21$ months

EXAMPLE 3 Calculating Compound Interest

You deposit \$2000 into an account that earns 3.6% interest compounded annually. Find the balance after 5 years.

Solution

$$\begin{aligned} A &= P(1 + r)^t && \text{Write formula.} \\ &= 2000(1 + 0.036)^5 && \text{Substitute.} \\ &\approx 2386.87 && \text{Use a calculator.} \end{aligned}$$

Answer: The balance of the account after 5 years is about \$2386.87.

Exercises for Example 3

For an account that earns interest compounded annually, find the balance of the account. Round your answer to the nearest cent.

4. $P = \$35$, $r = 2.5\%$, $t = 10$ years
 5. $P = \$100$, $r = 7.5\%$, $t = 4$ years
 6. $P = \$2000$, $r = 5.4\%$, $t = 7$ years
 7. $P = \$20$, $r = 8.2\%$, $t = 8$ years